CLAIMS

1. A thermal processing method comprising:

a step of conducting a predetermined thermal process in a low temperature zone to a plurality of objects to be processed held in a tier-like manner by a heating unit, in a processing container that is made of metal and has the heating unit therein, and

a step of introducing a cooling gas into respective areas in the processing container divided in a height direction of the objects to be processed, after the thermal process is completed.

2. A thermal processing method according to claim 1, wherein

the processing container has a volume of about 170 liter, and

the step of introducing a cooling gas includes a step of introducing a cooling gas into the processing container at a flow rate of 300 to 500 liter / min.

3. A thermal processing method according to claim 1 or 2, wherein

the processing container has a container-cooling unit in which a coolant flows, and

the step of introducing a cooling gas includes a step of operating the container-cooling unit so as to cool the objects to be processed to a temperature of 400 °C to 100 °C at a temperature-fall rate not less than about 40 °C / min.

4. A thermal processing unit for conducting a thermal process to a plurality of objects to be processed held in a tier-like manner in a processing container, wherein

the processing container is made of metal, and

a heating unit that heats the objects to be processed, and a cooling-gas introducing unit having a plurality of blowing holes for introducing a cooling gas into respective areas in the

processing container divided in a height direction of the objects to be processed, are provided in the processing container.

5. A thermal processing unit according to claim 4, wherein

a circular space is formed between the processing container and the plurality of objects to be processed held in a tier-like manner,

the cooling-gas introducing unit is a cooling-gas introducing pipe arranged in the circular space and extending in a vertical direction,

the plurality of blowing holes is formed at suitable intervals in the vertical direction of the cooling-gas introducing pipe, and

each blowing hole is formed at a pipe wall of the cooling-gas introducing pipe in order to blow out the cooling gas in a tangential direction of the circular space.

6. A thermal processing unit according to claim 5, wherein

a plurality of cooling-gas introducing pipes is arranged at suitable intervals in a circumferential direction of the circular space.

7. A thermal processing unit according to claim 5, wherein

the plurality of cooling-gas introducing pipes has different lengths in the vertical direction.

8. A thermal processing unit according to any of claims 4 to 7, wherein

the blowing hole is provided with a porous member.

9. A thermal processing unit according to any of claims 4 to 8, wherein

the processing container has a volume of about 170 liter, and

the cooling-gas introducing unit is capable of introducing a cooling gas into the processing container at a flow rate of 300

to 500 liter / min.

10. A thermal processing unit according to any of claims 4 to 9, wherein

the processing container has a container-cooling unit in which a coolant flows.

11. A thermal processing unit according to claim 10, wherein

the cooling-gas introducing unit and the container-cooling unit are capable of cooling the objects to be processed to a temperature of 400 °C to 100 °C at a temperature-fall rate not less than about 40 °C / min.